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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,586	03/30/2001	Harold S. Stone	14406 (NECI 1100)	1271

7590 10/17/2005

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EXAMINER

TUCKER, WESLEY J

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/822,586

Applicant(s)

STONE ET AL.

Examiner

Wes Tucker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 29-56 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 29-56 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's response to the last office action, filed January 24, 2005 has been entered and made of record.
2. Applicant has cancelled all previously pending claims 1-28 and replaced them with new claims 29-56.
3. Applicant's arguments with regard to the previously presented rejected claims 1-28 are therefore considered moot in view of the newly presented claims 29-56. A new rejection as necessitated by the newly presented claims has been made and accordingly been made final.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 29-31, 33-34, 39-41, 43-44, 49-51 and 53-54 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,266,452 to McGuire.

With regard to claim 29, McGuire discloses a method of blind registration of first and second images out of registration, the method comprising steps of:

a) applying non-linear pre-filtering and thresholding to the first and second images (column 9, lines 31-40 and column 10, lines 39-59). McGuire discloses pre-filtering the images before Fourier transforming the images. McGuire also discloses a form of thresholding the images in the process of wavelet decomposition. The images are wavelet decomposed effectively sending only the low sub-bands to the Fourier transformation. This is interpreted as thresholding the images because a threshold is set for which sub-bands are sent to the Fourier transformation.

McGuire further discloses step b) registering the first and second images by evaluating normalized correlation between first and second images as a function of relative image position, where the normalized correlation is expressed as vector correlations computed in the Fourier domain (column 8, lines 35-50 and column 12, lines 50-55).

With regard to claim 30, McGuire discloses wherein the normalized correlation is expressed as:

Where x is the first image expressed as an N -vector image, y is an M -vector pattern drawn from the second image, y is the y vector extended to length N , and m is a mask vector whose first M elements are 1 and whose last $N-M$ elements are 0 (column 13, lines 25-35).

With regard to claim 31, McGuire discloses the method of claim 29 further comprising the step of reducing resolution of the first and second images prior to registering the first and second images (column 10, lines 45-60).

With regard to claim 33, McGuire discloses the method of claim 31 further comprising a step of blurring the first and second images prior to reducing resolution of the first and second images, where the images are blurred with a filter that thickens each pixel in a an array that extends from a central pixel (column 15, lines 25-38).

With regard to claim 34, McGuire discloses the method of claim 31 wherein the first and second images are registered at a low resolution and the resolution is subsequently refined to obtain higher precession (column 14, lines 5-14).

With regard to claims 39 and 49, the discussion of claim 29 applies. McGuire discloses the method discussed in regard to claim 29 to be embodied in a computing environment in order to process digital pixel images (column 6, lines 43-53).

With regard to claims 40 and 50, the discussion of claim 30 applies.

With regard to claims 41 and 51, the discussion of claim 31 applies.

With regard to claims 43 and 53, the discussion of claim 43 applies.

With regard to claims 44 and 54, the discussion of claim 34 applies.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 32, 42 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 6,266,452 to McGuire and 6,378,572 to Neubauer et al.

With regard to claim 32, McGuire discloses the method of claim 31, but does not explicitly disclose wherein the resolution of the first and second images is reduced by partitioned the first and second images into blocks of pixels, each block of pixels is replaced by a sum of pixel values in the block. This type of resolution reduction is common in the art. This claim is interpreted as the each block of pixels being replaced by a an average of the pixel block rather than a sum of the pixel values in the block. Replacing the block with the sum of all pixels will not serve to reduce the resolution of the image, the image will be reduced in resolution but the content of the image will be changed completely. Neubauer discloses reducing the resolution of an image by replacing a block of pixels with the average of that block (column 4, line 60-column 5, line 5). This method serves to maintain the image information, but with less detail and

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at a lower resolution enabling faster processing time for registration. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to use the block averaging resolution reduction in order to reduce resolution while maintaining image information and to decrease processing time for the use of registration of images.

With regard to claims 42 and 52, the discussion of claim 32 applies.

6. Claims 35, 36, 45, 46 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patents 6,266,452 to McGuire and 6,075,905 to Herman et al.

With regard to claim 35, McGuire discloses the method of claim 29, but does not disclose wherein applying the nonlinear pre-filtering further comprises applying an edge enhancement filter to make edges in the first and second images more prominent. Herman teaches the use of an edge enhancement filter to make edges more prominent in order to have more usable edge information content at low resolution levels (column 21, lines 40-53). Therefore it would have been obvious to one of ordinary skill in the art to use the edge enhancement taught by Herman before the resolution reduction in the method of McGuire.

With regard to claim 36, McGuire and Herman disclose the method of claim 35, and Herman discloses wherein the edge enhancement filter is direction independent to reduce computational costs (column 21, lines 40-50). The edge enhancement filter is interpreted as direction independent because it is only useful in images where there is strong edge information.

With regard to claims 45 and 55, the discussion of claim 35 applies.

With regard to claim 46, the discussion of claim 36 applies.

7. Claims 37, 38, 47, 48 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of U.S. Patents 6,266,452 to McGuire and 5,600,734 to Okubu et al.

With regard to claim 37, McGuire discloses the method of claim 29, but does not disclose wherein applying thresholding to the first and second images further comprises computing a histogram of pixel intensities and setting a threshold for which a percentage are over the threshold. The practice of using a pixel intensity histogram to determine a threshold for creating a binary image is exceedingly well known in the art. Okubo discloses the use of a histogram to determine a threshold for rendering a binary image (column 24, lines 35-45) and teaches that the edges in the binary image are used to perform image correlation (column 24, lines 56-67). It is inherent that a certain

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percentage of pixels will be above and below the threshold by the definition of a threshold. Therefore it would have been obvious to one of ordinary skill in the art to use a pixel intensity histogram to calculate a threshold in order to render a binary image and make the edge information more distinct and useful as taught by Okubu, especially in the environment of blind cross-correlation because a binary image will show correlative edge information in black and white.

With regard to claim 38, McGuire and Okubu disclose the method of claim 37. The choice of wherein the threshold is 70 to 80 percent of pixels in the images is a matter of design choice and can be chosen accordingly to any routine experimentation that provides desirable results.

With regard to claims 47 the discussion of claim 37 applies.

With regard to claims 48 the discussion of claim 38 applies.

With regard to claim 56, the discussions of both claims 37 and 38 apply.

Conclusion

Applicant's amendment necessitated the new grounds of rejection presented in the Office Action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wes Tucker whose telephone number is 571-272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Wes Tucker

9-11-05



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PRIMARY EXAMINER